COUNTY FOREST COMPREHENSIVE LAND USE PLAN

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CHAPTER 800

INTEGRATED RESOURCE MANAGEMENT

800 CHAPTER OBJECTIVE

To introduce and communicate to the public, the County Board of Supervisors, and to the Wisconsin DNR, the integrated resource approach that forestry, wildlife and other natural resource staff will use on the county forest during this planning period.

805 INTEGRATED RESOURCE MANAGEMENT APPROACH

Integrated Resource Management is defined as: "the simultaneous consideration of ecological, physical, economic, and social aspects of lands, waters and resources in developing and implementing multiple-use, sustained yield management" (Helms, 1998).

This balance of ecological, economic, and social factors is the framework within which the county forest is managed.

The working definition of Integrated Resource Management means, in large part, keeping natural communities of plants and animals and their environments healthy and productive so people can enjoy and benefit from them now and in the future.

The remainder of this chapter is written to help communicate how the Forest is managed on an integrated resource approach.

810 SUSTAINABLE FORESTRY

"The practice of managing dynamic forest ecosystems to provide ecological, economic, social and cultural benefits for present and future generations" NR 44.03(12) Wis. Adm. Code and s.28.04 (1) (e), Wis. Stats.

For the purpose of this chapter, <u>sustainable</u> <u>forestry</u> will be interpreted as the management of the Forest to meet the needs of the present without knowingly compromising the ability of future generations to meet their own needs (economic, social, and ecological) by practicing a land stewardship ethic which integrates the growing, nurturing, and harvesting of trees for useful products with the conservation of soil, air and water quality, and wildlife and fish habitat. This process is dynamic, and changes as we learn from past management.

810.1 Tools in Integrated Resource Management

810.1.1 Compartment Recon

The County will support and utilize the compartment reconnaissance procedures as set forth by the DNR Public Forest Lands Handbook 2460.5. WisFIRS serves as the database for housing recon information.

810.1.2 Forest Habitat Classification System

The Forest Habitat Classification System (*A Guide to Forest Communities and Habitat Types of Northern Wisconsin Second Edition; Kotar, et al*.) is a natural classification system for forest communities and the sites on which they develop. It utilizes systematic interpretation of natural vegetation with emphasis on understory species.

810.1.3 Soil Surveys

Forestry staff's knowledge of forest ecology and their experience across the landscape can assist in associating forest habitat types and site indices with soil type information. These associations can be beneficial in determining management prescriptions for specific sites. WisFIRS contains soil survey data, and this information can also be found on the NRCS website-based soil survey.

810.1.4 Ecological Landscapes of Wisconsin

The Wisconsin DNR uses Ecological Landscapes of Wisconsin (WDNR Handbook 1805.1) which is an ecological land classification system based on the National Hierarchical Framework of Ecological Units (NHFEU). Ecological landscapes distinguish land areas different from one another in ecological characteristics. A combination of physical and biological factors including climate, geology, topography, soils, water, and vegetation are used. They provide a useful tool and insight into ecosystem management. Land areas identified and mapped in this manner are known as ecological units.

Generally accepted silvicultural systems are prescribed on a stand level scale, in recognition of the position within an ecological landscape.

810.1.5 Integrated Pest Management

"The maintenance of destructive agents, including insects, at tolerable levels, by the planned use of a variety of preventive, suppressive, or regulatory tactics and strategies that are ecologically and economically efficient and socially acceptable"

The Committee has the authority to approve and direct the use of pesticides and other reasonable alternatives in an integrated pest management program on the Forest. Refer to Chapter 600 (610.3) for more detailed discussion and integrated pest management strategies.

810.1.6 Best Management Practices for Water Quality

The most practical and cost-effective method to assure that forestry operations do not adversely affect water quality on the County Forest is to utilize "best management practices" (BMP's) as described in *Wisconsin's Forestry Best Management Practices for Water Quality. Publication number FR-093*.

Consistent with the aforementioned manual the county will use BMP's on the Forest with the understanding that the application of BMP's may be modified for specific site conditions with guidance from a forester or other natural resource professional. Modifications will provide equal or greater water quality protection or have no impact on water quality. Areas with highly erodible soil types, proximity to streams or lakes, or steep slopes may require mitigating measures in excess of those outlined in the manual. All county employees practicing forestry will receive BMP training. Additionally, the county will encourage BMP training of all logging contractors that operate on county timber sales.

810.1.7 Fire Management

Reference Chapter 600.

810.1.7.1 Prescribed Fire

Prescribed burning on the County Forest may play an important role in management. Many of the plant communities present today are the result of wild fires. Presently, prescribed fire is used to manage the Athelstane Barrens and the Shrine Road Openings, but fire could be used elsewhere on the forest for a variety of forest management purposes.

As the needs are presented to regenerate or maintain timber types or other plant communities, the Committee will examine the costs and benefits of each opportunity. Increased regulations, the county's cost of completing the burn, and the risk of breakouts and uncontrolled fires will have to be considered with any benefits of vegetation management through prescribed burning.

All prescribed burning will be done in accordance with Wisconsin State Statutes 26.12, 26.14, and the DNR Prescribed Burn Handbook 4360.5 and in cooperation with the Department of Natural Resources per section 605.5 of this plan.

810.1.8 Outside Expertise, Studies and Survey

Additional data necessary to make management decisions on the County Forest will be sought from agencies or individuals, who have the best capability and technical expertise, including, but not limited to:

- Water Resources: WDNR
- Wildlife Resources: WDNR
- Soil Resources: NRCS
- Mineral Resources: WDNR
- Wetland Resources: WDNR, Army Corps of Engineers, County Zoning
- Navigable Streams: WDNR, Army Corps of Engineers, County Zoning

- Floodplains: County Zoning
- Cultural Resources: WDNR, State Historical Society
- Entomology / Pathology: WDNR
- Endangered Resources: WDNR
- Forestry: Cooperative Field Trials, see WDNR website
- Other subjects as needed

810.1.9 Local Silvicultural Field Trials

A variety of silvicultural field trials have been conducted on the forest, primarily to achieve better natural regeneration of various tree species. Recently, as red oak stands begin to approach economic maturity, efforts to regenerate this species have intensified. Extra measures have included herbicide application to set back undesirable competing species, mechanical removal of less desirable tree species to both remove stump sprout competition and provide more mineral soil for oak seedling germination. Also, the county has installed twelve deer exclosures in a variety of sites around the Marinette County Forest. We hope to find increased red oak seedling recruitment and retention. Similarly, efforts to regenerate northern hardwoods have increased as foresters become more concerned about the lack of sugar maple regeneration, and the proliferation of ironwood in the past 20 years. There are currently two locations where trial mechanical ironwood treatments have been implemented. At this time the ironwood studies are still waiting for results. Other major tree species that have received treatments to improve regeneration success are jack pine, red pine, white birch and white pine. Chaining and using the Salmon Blade have been implemented in some of these areas.

Most of the time, these trials are initiated and carried out by a combination of county foresters, DNR foresters, and equipment operators from both the county and local DNR. However, recently DNR Forest Analysts have established two trials in the county forest to study regeneration problems in northern hardwoods. One involves cutting ironwood at various stump heights during the growing season to see they die, and the other study consists of creating large canopy gaps in northern

hardwoods, combined with scarification and seeding. Both studies are currently ongoing and will likely be completed by 2024.

Many tools have been used and will continue to be used in the effort to improve regeneration. The county owns anchor chains, a salmon blade, a roller chopper, a shearing blade, and a ground sprayer for spraying herbicides. DNR tools that have been used are a fecon, root rake, and a trailer mounted ground sprayer. Sustainable Forestry Grants have been obtained from the DNR for doing some of this work and buying equipment.

Record keeping is necessary to track the outcomes of these various trials. The Wisconsin Forest Inventory and Reporting System (WisFIRS) is the best long term system for tracking silvicultural trials. The WisFIRS data is documented in the notes section of the affected stands. However more detailed files are kept by county and DNR foresters, and a wall map of Natural Regeneration Efforts has been created to visually help track silvicultural trials. To date, at least two dozen silvicultural trials are being tracked. Since the goal of most of these trials is to get tree regeneration, and since deer over browsing is suspected to be part of the problem, many of these trials have a deer exclosure contained within them to help determine the effect of deer browsing.

815 MANAGEMENT CONSIDERATIONS TO REDUCE LOSS

815.1 RISK FACTORS

815.1.1 Wind, Flooding, Fire

The response to all three of these damaging agents is similar. It begins with assessing the severity of damage to the forest and the infrastructure, and continues with responding to the damage appropriately, with the best interests of the county and the resource in mind. Initial assessment can be done by having a DNR plane fly over the affected area, taking photos and making a rough map. Assessment

continues on the ground. Degree of damage can be variable, so priorities must be established. The safety of the public and employees are first priority. If necessary, access to the area must be obtained early on by opening up roads with heavy equipment, chainsaws, and perhaps logging equipment. After the event has been stabilized, salvage of forest products must be considered. Forest products deteriorate, rendering them unsaleable to mills, and insect outbreaks can occur, threatening more of the resource. The county will work with logging contractors to salvage forest products as quickly as possible, recognizing that the value of such may be significantly less than normal. Prioritizing the areas to salvage is necessary since not all areas may be salvageable, especially where the damage is not as severe. In the case of fire damage, charred wood may be difficult to market, and if biomass markets are poor, then some salvage may not be possible. As salvage is occurring, the productivity of the forest must be considered. Will natural regeneration occur? Will planting be necessary to assure an acceptable crop of timber will be harvested in the future? The Wisconsin Forest Inventory and Reporting System (WisFIRS) will be used to track regeneration of stands. In the case of flooding damage on the county forest, salvage efforts may be limited since it is usually better to retain coarse woody debris in riparian zones.

815.1.2 Climate Change

The county will deal with potential climate change by being informed and using the best science available to respond to climate change if necessary. Maintaining a diversity of native tree species is always a cornerstone of good forest management, whether climate change occurs or not.

815.1.3 Timber Markets

Poor timber markets is a risk factor that has occurred in the past and will likely occur again in the future, but most markets usually rebound, given time. The county by itself, cannot greatly influence markets, but they can have some influence. Without markets forest management cannot be accomplished. Without logging contractors, trees cannot be harvested. In the event of loss of markets, the county

will work with contractors, treating them equally with consistent policy. Timber can be sold at reduced rates. Timber sale establishment might shift to tree species and products that are marketable. Contracts could be extended. Perhaps the best way the county can support the wood products industry is by keeping the raw materials flowing out of the county forest and practicing good forestry to assure a future supply of timber.

820 PLANT COMMUNITIES MANAGEMENT

Marinette County recognizes the importance of maintaining the diversity of the forest under an ecosystem approach. The process involved in making management decisions to encourage or not encourage specific species or communities is complex. It includes an understanding of:

- Objectives of the County
- Integration of landforms, soils, climate, and vegetative factors
- Habitat classification
- Past, present and future desired condition
- Surrounding ownership patterns and general objectives
- Wildlife habitat and other values
- Social needs

Maintaining a diverse forest is good forest management for many reasons. A diverse forest is a healthier forest. Insect and disease outbreaks can be more damaging where large monotypic stands of timber occur, especially if the pest is not native to Wisconsin.

Some tree species have been virtually eliminated from the county forest in the past, and other species are likely to disappear in the future due to insects and disease. Examples of trees that for practical purposes have been lost are American Elm and Butternut. In the not too distant future, Ash, Beech, and Hemlock may be eliminated. All of these losses make the forest less diverse and less resilient, and it is likely that more exotic pests will be introduced in the future.

Maintaining a diverse forest makes sense from the standpoint of putting wood on the market that is in demand. The marketability of tree species and products changes over time. A tree that is not economically valuable today, may be more valuable in the future.

Maintaining a diverse forest is also important from the ecological standpoint. A diverse forest supports a diversity of animal and plant life which play a role in the overall forest ecology. Some of these species, such as deer and grouse the public is greatly interested in, and other species receive little interest, but are just as important, even though their role in the forest may not be apparent.

Since the county forest is third party certified, Marinette County will follow Green Tree Retention guidelines established by the Wisconsin County Forests Association (WCFA). This basically, requires Harvest Units that are being regenerated on an even-aged system to retain green trees in the quantity of at least 3% of the acreage or a basal area of 3 square feet. This is a good requirement to help create more diversity and has minimal effects on forest productivity. Under certain circumstances, Green Tree Retention may not be implanted and the reasons will be documented and explained clearly within the affected timber sale contract.

Other steps that the county forest can take to increase diversity are:

- Break up large same aged blocks of aspen into smaller blocks to create age-class diversity.
- Considering the landscape surrounding a given harvest unit, retain white pine in coppice harvests so that the overall composition of white pine on the forest increases. Presently, the county forest is about 1% white pine and 50% aspen.
- Considering the condition of a given northern hardwood stand, regenerate the stand using the shelterwood system to create an even-aged stand. This will create a more diverse stand for the future instead of having a pure sugar maple stand. This may also be the only way to regenerate northern hardwoods, considering the over-browsing damage done by deer.
- Continue planting jack pine on a smaller scale than in the past until the current jack pine health issues are resolved. Jack pine acreage on the forest is decreasing and promoting it would be good for diversity.

820.1 SILVICULTURAL PRACTICES/TREATMENTS

Silviculture is the art and science of controlling forest composition, structure, and growth

to maintain and enhance the forest's utility for any purpose. These practices are based on research and general silviculture knowledge of the species being managed. The goal is to encourage vigor within all developmental stages of forest stands, managed in an even aged or uneven aged system. The application of silviculture to a diverse forest needs a unified, systematic approach. The DNR Public Forest Lands Handbook (2460.5) and DNR Silvicultural Guidance will be used as guidelines for management practices used on the County Forest.

820.1.1 Natural Regeneration

Where feasible, natural regeneration will be encouraged through the use of silvicultural methods that promote regrowth and recruitment of the forest. In general, the particular silvicultural method chosen will depend on the biological functions of the target species or forest type.

820.1.1.1 Clearcutting/Coppice

Clearcutting is a silvicultural method used to regenerate shade intolerant species. Complete, or nearly complete removal of the forest canopy will stimulate the regeneration and growth of species such as aspen, jack pine and white birch. This method is also used as a final rotation removal in species such as red oak, red pine and others. Tree retention guidelines are followed when prescribing clear-cut or coppice cuts.

820.1.1.2 Shelterwood / Seed Tree

Shelterwood harvest is a method used to regenerate mid-shade tolerant and shade tolerant species. Partial canopies stimulate regeneration, enhance growth and can provide seed source. Canopies are eventually removed. This method is used for white birch, white pine, red oak, and northern hardwood (when managing even aged).

820.1.1.3 All Aged Regeneration Harvests

All aged regeneration harvests are used in shade tolerant species. Gaps in the forest canopy allow regeneration to occur throughout the stand. Over time, multiple entries into the stand will create multiple age class structure with the intent of creating a fully regulated stand. All aged regeneration harvests may be prescribed in the form of single tree selection, group selection or patch selection. This method is used in northern hardwood and occasionally in swamp hardwoods (when managing for all aged).

820.1.1.4 Prescribed Burning

Prescribed burning may be utilized as a tool to promote regeneration. A number of forest types in the county are ecologically tied to fire. Burning may create seeding conditions or release regeneration from competing vegetation. Prescribed fire may be used for regeneration of red oak, jack pine or white pine.

820.1.1.5 Soil Scarification

Scarification is a technique used to prepare a seedbed beneath forest stands scheduled for harvest and regeneration. This mechanical disturbance that exposes bare mineral seedbeds and creates conditions necessary for regeneration of pine species. Disturbance that mixes seed into duff and soil layers creates optimal conditions for regeneration of oak, white birch, fir and others. The county utilizes a salmon blade, root rake, straight blade, and anchor chains for soil scarification.

820.1.1.6 Other

Other natural regeneration techniques may be considered where necessary and appropriate. New methods for natural regeneration are continually tested for effectiveness.

820.1.2 Artificial Regeneration

When natural regeneration fails, or when tree species present do not coincide with management objectives for the site, artificial means will be employed to establish a desirable stand of trees. Artificial regeneration on a site usually requires some form of site preparation followed by seeding or planting.

820.1.2.1 Mechanical Site Preparation

Mechanical site preparation includes the use of soil disturbance equipment such as a disc, roller chopper, patch scarifier, disk trencher or V-plow prior to tree planting or seeding. These types of equipment are used to reduce logging debris to a smaller size, incorporate debris into the soil, clear brush and debris from the site, and to reduce competition from other vegetation.

820.1.2.2 Chemical Site Preparation

Herbicide application can be an effective means of controlling unwanted vegetation in order to establish seedlings or plantations. It should be used sparingly and in situations where mechanical treatment is not expected to provide the level of vegetative control needed. Chemical will be applied in strict accordance with label recommendations, requirements, and under the oversight of a certified applicator. Herbicides will normally be applied with motorized, ground based equipment, hand applications, or aerially. A written prescription for each herbicide application will be prepared and kept on file.

820.1.2.3 Prescribed Burning

Prescribed burning for site preparation can be used to reduce logging debris, clear the site, reduce competing vegetation, and to release nutrients into the soil.

820.1.2.4 Tree Planting / Seeding

Both machine and/or hand planting/seeding will be utilized to insure adequate regeneration. The selection of species will be determined according to the specific management objectives and capabilities of each site. Planting or seeding will primarily occur in areas where natural regeneration is inadequate or conflicts with the management goals of the site. County will make all reasonable efforts to source seeds/seedlings from local genetics.

820.1.3 Intermediate Treatments

Intermediate treatments are those practices used to enhance the health and vigor of a forest stand. In general, intermediate treatments are applied to forest stands managed as even aged.

820.1.3.1 Mechanical Release

Mechanical release is the removal of competing vegetation by means other than herbicide or fire. Mechanical may include releasing young pine plantations from competing vegetation using chain saws or other hand-held equipment; or mowing to release regeneration.

820.1.3.2 Chemical Release

Chemical Release is the removal of competing vegetation from desirable trees through the use of herbicides. It should be used sparingly and in situations where mechanical treatment is not expected to provide the level of vegetative control needed. Chemical will be applied in strict accordance with label recommendations, requirements and under the oversight of a certified applicator. A written prescription for each herbicide application will be prepared and kept on file.

820.1.3.3 Non-Commercial Thinning (TSI)

In general, most thinning needs are accomplished through commercial harvest operations. Non-commercial thinning may be considered if the individual site requirements, funding and/or available labor make it desirable.

820.1.3.4 Thinning / Intermediate Cuts

Management of some even aged forest types necessitates the use of commercial thinning, also known as intermediate harvests, to maintain forest health and vigor. Thinning is generally prescribed in forest types such as red pine, red oak, and in cases of even aged hardwood management. Thinning may be prescribed on other even aged types as appropriate and where feasible. Intermediate harvests include prescriptions for residual densities, marking priorities, spacing, crown closure, diameter distribution, or other measurements.

820.2 SILVICULTURAL PRESCRIPTIONS

820.2.1 Even-Aged Management

A forest stand composed of trees having relatively small differences in age. Typical cutting practices include: clear cutting, shelterwood cutting and seed-tree cutting. Even aged management is generally required to manage shade intolerant, early successional forest types.

820.2.1.1 Aspen

These are types where aspen trees comprise more than 50% of the stems. On the forest, aspen types may be dominated by quaking or big tooth aspen or a combination of both. Aspen stands contain a wide variety of associated hardwood and conifer species.

Shade tolerance:	*Intolerant*
Habitats:	*Primarily dry-mesic, but will grow on any upland habitat type*
Intermediate treatments:	*None*

Median rotation age:	*46 years*
Primary regeneration method:	*Natural*
Harvest method:	*Clearcutting with coppice*
Habitat value:	*Early successional related species*
Economic value:	*Fiber production / bolts*
Insect disease considerations:	*Hypoxylon, Bronze Poplar Borer*
Trends:	*Aspen acreage is fairly stable. A large acreage of 35-45 year old aspen is nearing maturity and should be broken into smaller stands of various ages.*
Landscape considerations:	*Slight decrease in aspen acreage will occur as some natural conversion to white occurs. White pine is the climax species on most aspen sites and is only 1% of the county forest compared to 49 % for aspen*

820.2.1.2 Jack Pine

These are types where jack pine makes up more than 50% of the stems. Common associates in Marinette County are pin oak, aspen, and white birch.

Shade tolerance:	*Intolerant*
Habitats:	*Primarily dry and dry-mesic habitat types*
Intermediate treatments:	*None*
Median rotation age:	*45 years for natural stands and 35 for planted stands*
Primary regeneration method:	*Natural for natural stands and planting for plantations*
Harvest method:	*Clear-cut*
Habitat value:	*Early successional dependent species, especially Kirtland's Warbler*
Economic value:	*Primarily pulpwood/some bolts*
Insect disease considerations:	*Root Collar Weevil, Pine/Oak Gall Rust, Jack Pine Budworm, HRD*
Trends:	*Acreage is declining due to natural conversion to aspen.*
Landscape considerations:	*Attempts should be made to maintain natural stands. Some plantations should be replanted, especially in the Kirtland's Warbler Management Area. Otherwise, planting of jack pine should be somewhat limited until the current health issues are resolved*

820.2.1.3 Red Pine

For the red pine timber type, at least 50% of the basal area is red pine. It occurs in natural stands and very commonly in plantations.

Shade tolerance:	*Intolerant*
Habitats:	*Primarily dry and dry-mesic, but can be found on higher types where old fields were planted to red pine.*
Intermediate treatments:	*Thinning*
Median rotation age:	*80 years*
Primary regeneration method:	*Planting*
Harvest method:	*Clearcutting*
Habitat value:	*Primarily wildlife cover, especially younger stands*
Economic value:	*Fiber production / bolts/logs/poles*
Insect disease considerations:	*HRD, Pocket Decline, Bark Beetles*
Trends:	*Hard to determine if acreage will remain stable since natural stands will eventually be lost, but jack pine stands will be replanted to red pine. A large acreage of 80+ year old plantations will need replanting in the next 15 years.*
Landscape considerations:	*Since red pine is a valuable species and occupies only about 7% of the county forest, the acreage should be maintained or slightly increased.*

820.2.1.4 White Pine

For the White Pine type, at least 50% of the basal area is white pine.

Shade tolerance:	*Intermediate*
Habitats:	*Found on a wide range of habitats, but is the climax species on the dry and dry-mesic habitats.*
Intermediate treatments:	*Commercial thinning.*
Median rotation age:	*130 years*
Primary regeneration method:	*Natural, using shelterwood system*
Harvest method:	*Overstory removal*
Habitat value:	*High wildlife value, especially young stands and old stands. Large, old snags provide coarse woody debris.*
Economic value:	*Pulp and sawlogs, although somewhat low in value.*

Insect disease considerations:	*Tip Weevil and Blister Rust*
Trends:	*White pine acreage should be slowly increasing as a secondary cover type since it becomes established in the understory of other timber types, but this conversion is a slow process.*
Landscape considerations:	*At the landscape level, for the sake of diversity, a deliberate effort should be made to increase the white pine acreage by retaining it in aspen coppice harvests. Presently the county forest is 50% aspen and 1% white pine.*

820.2.1.5 Red Oak

For the Red Oak type, at least 50% of the basal area is red oak.

Shade tolerance:	*Intermediate*
Habitats:	*Found on a wide range of habitats. Grows best on mesic types, but competes best on dry-mesic types.*
Intermediate treatments:	*Commercial thinning.*
Median rotation age:	*90 years*
Primary regeneration method:	*Natural, using shelterwood system*
Harvest method:	*Overstory removal*
Habitat value:	*Most valuable wildlife species due to mast production.*
Economic value:	*High value, especially for sawlogs.*
Insect disease considerations:	*Oak Wilt.*
Trends:	*Red Oak acreage is decreasing due to the difficulty of regenerating it and the impact of oak wilt. Most oak stands are 80+ years old and need to be regenerated soon.*
Landscape considerations:	*Efforts should continue to regenerate red oak where feasible, using the wide array of tools available. Regeneration trials already established should be monitored for the value of the various treatments applied. Oak wilt should be controlled where feasible.*

820.2.1.6 Scrub Oak

For the Scrub Oak type, at least 50% of the basal area is scrub oak.

Shade tolerance:	*Intolerant*
Habitats:	*Predominantly dry and dry-mesic types.*
Intermediate treatments:	*Normally no intermediate treatments, but*

	in unusual situations, such as for aesthetic reasons, scrub might be thinned at around age 50.
Median rotation age:	*70 years. Experience has shown that stands carried to over 80 years are highly susceptible to two-lined chestnut borer mortality during periods of drought combined with gypsy moth and forest tent caterpillar defoliation.*
Primary regeneration method:	*Natural*
Harvest method:	*Coppice primarily, but in many situations, advanced regeneration is also released.*
Habitat value:	*Most valuable wildlife species due to mast production.*
Economic value:	*Somewhat low, but used for a variety of products, especially pulp, firewood, and low grade lumber.*
Insect disease considerations:	*Oak Wilt.*
Trends:	*Scrub oak acreage is declining due to conversion to aspen and oak wilt infestation. Many old stands have been harvested.*
Landscape considerations:	*Considering the surrounding landscape and the condition of the stand in question, some stands should be converted to red or jack pine by planting, especially in the Kirtland's Warbler Management Area.*

820.2.1.7 Lowland Timber Types

For the purpose of this plan, all lowland timber types are being lumped into one section. The types of significance on the county forest included are Swamp Hardwoods, Cedar, Black Spruce, and Tamarack.

Shade tolerance:	*Most species are intolerant.*
Habitats:	*Various wetland habitat types.*
Intermediate treatments:	*Intermediate treatments are rarely conducted in lowland types, however, in the past, white cedar has been thinned on a small scale.*
Median rotation age:	*90 years.*
Primary regeneration method:	*Natural*
Harvest method:	*Clearcut in all types, relying on regeneration by seed. Some coppice harvest in black ash.*

Habitat value:	*Lowland timber types are valuable for a wide array of wildlife that need lowlands and the riparian zones that are often found in lowlands.*
Economic value:	*Somewhat low, but pulp and low grade Sawlogs are common products. Cedar sawlogs can be fairly valuable.*
Insect disease considerations:	*Emerald Ash Borer*
Trends:	*Lowlands have become increasingly difficult to harvest due to high production logging equipment which involves heavy machines that cut large areas quickly, not allowing time to freeze the soil to support the machines. In addition, winters may be wetter and warmer. Also, seasonal restrictions on dry ground forces loggers to cut high ground in winter. All of this means lowlands are not being cut or regenerated.*
Landscape considerations:	*Since lowlands are difficult to harvest, the landscape will have an abundance of overmature lowland trees which will have some positive effect on animal species that need that habitat. There will undoubtedly be long term negative effect as stands are not regenerated and EAB devastates ash trees and upsets the whole wetland complex. It appears at this point that there is little that foresters can do to manage lowland types, other than occasionally cut small areas of high quality trees adjacent to uplands.*

820.2.2 Uneven-Aged Management

A forest stand composed of trees in various age and size classes. The typical cutting practice is selection cutting, where individual trees are removed from the stand. Regeneration is continually occurring after the stand is cut. Uneven-aged management is generally used to manage shade tolerant forest types.

820.2.2.1 Northern Hardwood

These are stands dominated by shade tolerant and mid-shade tolerant species. In Marinette County, northern hardwood stands are typically dominated by sugar maple, ash, basswood, beech, yellow birch and hemlock.

Shade tolerance:	Tolerant to mid-tolerant
Habitats:	Dry-mesic, mesic, and wet-mesic, but primarily mesic.
Intermediate treatments:	None
Median rotation age:	N/A
Primary regeneration method:	Natural – all aged regeneration
Harvest method:	Single tree
Habitat value:	Habitat for birds, mammals, amphibians, endangered plants
Economic value:	High
Insect disease considerations:	Emerald ash borer, sugar maple borer
Trends:	The trends are lack of desirable regeneration, increasing amounts of undesirable ironwood, and less diversity of tree species (trending towards purer sugar maple).
Landscape considerations:	There is lack of regeneration on the landscape due to over-browsing by deer, competition from ironwood, and possibly other factors not understood. Single tree selection is not working on the county forest, therefore opportunities should be looked for to apply the shelterwood system in appropriate stands and monitor the results. Scarification should probably be applied. Larger cuts may be useful to provide deer with more browse than they can destroy. Shelterwood cuts can provide more diversity to the stand and may be the only way to regenerate these stands.

820.3 LOCALLY UNCOMMON TREES

The presence or lack of a particular tree species is dependent on land capability, climate, natural range, natural or human disturbance and many other factors. The following trees

are considered uncommon on the county forest and likely across the general region. These trees may be left as reserves in even aged management prescriptions, or in thinnings and all aged regeneration harvests. They are a natural component of the forest, add diversity, and when practical, attempts should be made to perpetuate them.

820.3.1 American Elm (Ulmus americana.)

Is a scarce primarily due to Dutch elm disease. Healthy looking elm may be left uncut in hope that they may continue on the landscape as potential resistant seed sources.

820.3.2 Butternut (Juglans cinerea)

Is a declining due to butternut canker. Healthy individuals that appear to be canker free will be reserved in the forest as potential resistant seed sources.

820.3.3 Bitternut Hickory (Carya cordiformis)

Is a presently declining due to native pests. This decline has happened before. Hickory is not commercially valuable, but adds diversity to the forest and is a valuable wildlife species due to its mast production. Using the shelterwood system in appropriate northern hardwood stands where hickory is present, should help perpetuate this species.

820.4 FOREST TYPES REQUIRING INTENSIVE EFFORT TO REGENERATE

There are certain forest types within the County Forest that are difficult to regenerate. In many cases, this difficulty may be related to the exclusion of fire from the landscape, deer herbivory or other factors. The following list itemizes forest types with difficult regeneration and County management goals:

820.4.1 Northern Red Oak

Red oak is a highly valuable species for timber production, wildlife, and forest diversification. On the county forest, most red oak is 80+ years old and approaching an age where it must be regenerated or it will naturally convert to

mesic hardwoods, primarily red maple. The goal is to regenerate as much acreage as possible considering factors such as the costs and potential benefits, the likelihood of success, and individual stand conditions such as health, tree quality, presence of oak wilt, acreage, topography, amount of competition, and position in the landscape. This goal will be accomplished primarily by using the shelterwood system (and coppice where appropriate) and a full array of tools and techniques to reduce the competition and prepare a seedbed. Some potential tools to use are herbicides (broadcast and basal treatment), anchor chains, salmon blade, root rake, and prescribed fire. Oak wilt control will be accomplished using herbicides in girdles and on cut stumps.

820.4.2 White Birch

The white birch timber type is less than 1% of the county forest, and since it is a fire species, the acreage will likely become less in the future. However, it will always maintain a presence in the forest, especially along logging roads where extensive soil disturbance has occurred. Seeding is fairly reliable and the seeds can travel long distances on top of the snow, becoming established where little birch was found previously. The goal for white birch will be to regenerate it where practical, understanding that birch stands that are candidates for regeneration are few and far in-between. Depending upon stand conditions, the shelterwood system or various types of clear-cuts can be used to regenerate white birch. Scarification with the salmon blade or anchor chains is essential.

820.4.3 Red Pine

Red Pine is a highly valuable timber type on the forest. Presently 7% of the forest is red pine, but 30% of this is natural red pine which is slowly naturally converting to other forest types, therefore red pine acreage will decrease in time unless more acreage is planted. Establishing plantations requires intensive effort, but a successful plantation is highly productive. The goal for the forest is to maintain or slightly increase the red pine acreage. This will be accomplished by replanting existing plantations, planting some jack pine plantations to red pine, and converting

poorly productive stands from scrub oak or aspen to red pine. Herbicides must be used to control competition. Since most of the older plantations are former old fields which may be too small to aerial spray, ground spraying may have to be employed.

820.4.4 Jack Pine

Jack Pine is presently 4% of the forest and is about equally divided between natural stands and plantations. Although not nearly as economically valuable as red pine, it is a native species that adds diversity to the forest and has more wildlife value than red pine. Presently, most plantations are suffering from poor health, primarily caused by root collar weevils and pine/oak gall rust. The goal for jack pine is to maintain natural stands where stand conditions deem possible, using scarification tools like the anchor chains and salmon blade. The goal for jack pine plantations is to replant on a limited basis until the current health issues are resolved. Some planting should occur in the Kirtland's Warbler Management Area to create more bird habitat and to see if the health concerns can be overcome following recommended practices. Herbicides must be used to establish plantations, applied both aerially and from the ground.

820.4.5 Northern Hardwoods

The Northern Hardwood forest type is presently about 12% of the forest and is a valuable type, especially from the aspect of producing high quality hardwood sawlogs. In most stands, single tree selection is not producing desirable regeneration. The ironwood component is increasing and deer are destroying desirable species. Stand diversity is decreasing as the proportion of sugar maple increases. Soon Emerald Ash Borer will further decrease diversity. The goal for the northern hardwood type is to continue producing high quality hardwood sawlogs and begin to regenerate appropriate stands. The shelterwood system should be employed in appropriate stands to regenerate them and increase the species diversity. Intensive scarification using anchor chains or the salmon blade is likely to be needed. Installing canopy gaps which are larger than traditionally

used may be helpful. Large acreage harvests may provide more deer browse than they can destroy. Other non-traditional regeneration techniques should be considered.

820.5 INVASIVE PLANT SPECIES OF CONCERN

Invasive plants can cause significant damage to the forest. Invasive species can displace native plants and hinder the forest regeneration efforts. Preventing them from dominating forest understories is critical to the long-term health of the forest. There are a number of invasive plant species in varying densities on the County Forest. Some warrant immediate and continual treatment efforts while others may be allowed to remain due to extent and financial ability to control them. The County will continue to train staff in invasive species identification as well as attempt to secure funding sources to control them as much as is practical. Best Management Practices will be implemented. Most new woods roads will be bermed post timber harvest. Some invasive plants which are presently found on the forest are buckthorn, leafy spurge, spotted knapweed, barberry, and honeysuckle. At this time, DNR wildlife staff do extensive invasive plant control at the Athelstane Barrens and the Shrine Road Openings. They have also done honeysuckle and buckthorn control as part of their normal wildlife opening maintenance. New infestations will need to be evaluated as to the severity of the infestation and the likelihood of gaining control.

820.6 LEGALLY PROTECTED AND SPECIAL CONCERN PLANT SPECIES

There are plants in Wisconsin that are protected under the Federal Endangered Species Act, the State Endangered Species Law, or both. On County Forest, no one may cut, root up, sever, injure, destroy, remove, transport or carry away a listed plant without a valid endangered or threatened species permit. There is an exemption on public lands for forestry, agriculture and utility activities under state law. The County will, however, make reasonable efforts to minimize impacts to endangered or threatened plants during the course of forestry/silviculture activities (typically identified in the timber sale narrative).

The Wisconsin Department Natural Resources Bureau of Natural Heritage Conservation tracks information on legally protected plants with the Natural Heritage Inventory (NHI)

program. The NHI program also tracks Special Concern Species, which are those for which some problem of abundance or distribution is suspected, but not yet proven. The main purpose of this category is to focus attention on certain species before they become threatened or endangered.

The County has access to this data under a license agreement and is committed to reviewing this database for endangered resources that may occur within proposed land disturbing project areas.

820.7 TREE RETENTION GUIDELINES

Retaining living trees 5 inches DBH and larger in timber harvests is a good forest management practice. The DNR Silviculture Handbook should be referred to for detailed explanations of what a reserve tree is, the benefits of reserve trees, the potential costs of reserve trees, and considerations for reserve tree retention. The following section provides the details of how to implement the retention requirement, commonly referred to as Green Tree Retention.

Recommendations for Retention in Managed Stands: Reserve Trees, Mast Trees, Cavity Trees and Snags:

Sustainable forest management is implemented within a framework defined by landowner goals and objectives, ecosystem condition and potential, and sustainable silvicultural systems and practices. Forests are cultivated to provide a variety of socio- economic and ecological benefits. Sustainable forest management integrates multiple management goals and objectives into most silvicultural systems and the management of most stands and landscapes .Most stands that are actively managed include timber production as a management goal (often in concert with other goals). Tree retention typically focuses on crop tree selection and regeneration methods. To satisfy multiple objectives and provide multiple benefits, retain additional trees to achieve non-timber management objectives. Integrate the following recommendations for tree and snag retention into the management of most forest stands:

Even-aged Rotations

- Retain ≥ 3 (if available), preferably large, snags per acre
- Retain reserve trees and/or patches at 3-15% crown cover or stand area, including large vigorous trees, mast trees, and cavity trees. Reserve tree retention is a generally recommended silvicultural practice for stands ≥10 acres. It is encouraged in smaller stands, but operational, shading, and other biological issues may limit application.

Even-aged Intermediate Treatments

- Retain ≥3 (if available), preferably large, snags per acre.
- Retain ≥3 (if available), preferably large, cavity trees per acre.
- Retain ≥3 (if available), preferably large, mast trees per acre.
- If previously established, manage reserve trees and patches. Management may include timber harvesting or passive retention. Consider retaining ≥3 trees per acre to develop into large, old trees and to complete their natural lifespan. These trees may also satisfy cavity and mast tree recommendations. These trees will often become large snags and coarse woody debris.

Uneven-aged Systems

- Retain ≥3 (if available), preferably large, snags per acre.
- Retain ≥3 (if available), preferably large, cavity trees per acre.
- Retain ≥3 (if available), preferably large, mast trees per acre.
- Consider retaining ≥3 trees per acre to develop into large, old trees and to complete their natural lifespan. These trees may also satisfy cavity and mast tree recommendations. These trees will often become large snags and coarse woody debris. In cases where these recommendations for retention are not applied, then sound reasons and expected impacts of deviation should be documented.

When applying retention recommendations, be sure to consider:

- Retention considerations will occur at the"Harvest Unit" level. Harvest Unit is defined as the stands within a timber sale. RMZ (Riparian Management Zone) or Z (Exclusion from Management) prefix stands occurring within or adjacent to the Harvest Unit can provide retention opportunities. A full list of timber sale abbreviations can be found in the Wisconsin DNR Timber Sale and Silvucultural Handbooks located on the Wisconsin DNR website. Retention will be encouraged in all stands regardless of size that are managed as even-aged, but will not be absolutely required.
- Individual trees can provide multiple benefits and fulfill the intent of more than one of the above recommendations. For example, three large oak trees with cavities could satisfy the mast tree and cavity tree recommendations, as well as the large, old tree consideration.
- Retention of both vigorous and decadent trees will provide an array of benefits.
- In general, species diversity is encouraged when selecting trees to retain.
- Large trees and snags are >12 inches dbh, and preferably >18 inches.
- Trees retained can be scattered uniformly throughout a stand or irregularly dispersed, as single trees, groups, and patches. The general recommended strategy is to retain irregularly distributed patches along with scattered groups and individuals.
- Retention in aggregated patches generally provides the most benefits for wildlife and biodiversity. Also, patches retained can satisfy multiple benefits; for example, at stand rotation, and internal or adjacent unharvested buffer along a stream (RMZ) could provide a portion of reserve tree retention as well as satisfy BMP (water quality) recommendations. Patches should be >0.1 acres and generally <2.0 acres, but can be larger; reserve tree patches, particularly large ones, should be documented as retention patches.
- Harvesting of reserve trees may occur in the future or may be foregone to achieve other benefits. Retain reserve trees for at least one-half the minimum rotation age of the new stand (e.g. retain reserve trees at least 20-25 years if regenerating aspen). Consider retaining some trees to develop into large, old trees and to

complete their natural lifespan; these trees will often become large cavity trees, snags, and coarse woody debris.

- Retain as many snags as possible. Retention of snag diversity (species and size) can potentially provide the greatest array of benefits. Snags that are determined to be a threat to human safety can be cut and retained on site as coarse woody debris.
- Clearly designate, in writing and/or by marking, which trees should be retained prior to any cutting operations.

820.8 BIOMASS HARVESTING GUIDELINES

Harvesting biomass from the forest for fuel can be profitable when other types of fuels, such as propane and natural gas are higher priced. From time to time over the past few decades, biomass harvesting has occurred on the county forest. Presently, there is no market for biomass. Since harvesting biomass from the forest can have detrimental effects on soil nutrients, wildlife habitat, and soil compaction, guidelines have been developed by the Wisconsin Council on Forestry, the DNR, and a large group of interested stakeholders. A manual has been produced entitled Wisconsin's Forestland Woody Biomass Harvesting Guidelines. The county forest will follow these guidelines and be aware of any changes to the guidelines, which occurs periodically. At this time, the limiting soils for Marinette County are listed in the table below.

Marinette County Limiting Soils For Biomass Harvesting

Soil Type	Name	Slope
EaC	Emmert-Pence-Sarona Complex	6-15%
EaD	Emmert-Pence-Sarona Complex	15-35%
Ls	Loxley and Dawson Peats	0-1%
MhB	Menahga Sand	0-6%
MhC	Menahga Sand	6-15%
MhD	Menahga Sand	15-25%
MmB	Menahga-Mancelona-Menominee Complex	2-6%
MmC	Menahga-Mancelona-Menominee Complex	6-15%
MmD	Menahga-Mancelona-Menominee Complex	15-25%
Rm	Roscommon Rock Outcrop Complex	0-2%
ScB	Sayner Loamy Sand	1-6%

ScC	Sayner Loamy Sand	6-15%
SfB	Shawano Loamy Fine Sand	2-6%
SfC	Shawano Loamy Fine Sand	6-12%
SfD	Shawano Loamy Fine Sand	12-30%
SuB	Summerville Fine Sandy Loam	1-6%
SuC	Summerville Fine Sandy Loam	6-12%

Some noteworthy modifications to the guidelines can and do occur on the county forest when sites are prepared for tree planting and barrens are burned for habitat restoration. Only the General Guidelines are listed below. The manual should be referred to for more detailed information:

General Guidelines

1. Retain and limit disturbance to down coarse woody debris (CWD) already present, except on skid trails and landings.
2. Retain down fine woody debris (FWD) on site following harvest.
    - Retain down FWD already present (before cutting), except on skid trails and landings, to the extent feasible.
    - Retain FWD resulting from incidental breakage of tops and limbs in the general harvest area.
    - Retain and scatter tops and limbs ($\leq$ 4" diameter) from 10% of trees in the general harvest area (e.g. one average-sized tree out of every 10 trees harvested).
    - Fine woody debris (FWD) on site following harvest is a combination of pre-existing down FWD, along with wood that was cut or broken during harvest operations and left on the ground.
3. Do not remove the forest litter layer, stumps, and/or root systems.

825 ANIMAL SPECIES MANAGEMENT

The county forest provides a wide range of wildlife habitats from open grasslands/barrens to mature forests, from bogs to forested wetlands, from spring ponds to lake shorelines. A primary goal of wildlife management on the county forest is to provide a diversity of healthy ecosystems necessary to sustain and enhance native wildlife populations. This forest will be managed primarily to provide habitats for a suite of species rather than focusing on a specific species, with exceptions made for Federal or State Listed Endangered or Threatened Species.

825.1 TECHNICAL PLANNING

Management of wildlife populations on the county forest falls under the jurisdiction of the DNR. Planning may be a cooperative effort of the county forest staff, DNR liaison forester and wildlife manager in formulating management plans and utilizing forest and wildlife management techniques to accomplish desired forest and wildlife management goals.

825.2 GUIDELINES

DNR operational handbooks including the Public Forest Lands Handbook (2460.5), manual codes and guidance documents are important references and guidelines to utilize in fish and wildlife planning efforts.

825.3 INVENTORY

Habitat needs will be determined by analysis of forest reconnaissance information. Population estimates will be conducted periodically by DNR wildlife, endangered resources personnel, and other trained cooperators. Currently, DNR wildlife staff conduct the following surveys on or adjacent to the county forest:

- ***Summer deer observations*** *help to predict deer populations and regulate harvest.*
- ***10 Week Brood surveys*** *for turkeys and grouse help to measure populations, which is currently more important considering the presence of West Nile Disease in grouse.*

- ***Woodcock Surveys*** *are conducted on two routes through county lands as part of the Federal American Woodcock Singing-Ground Survey. This is a general predictor of population levels.*
- ***Grouse Drumming Surveys*** *are conducted in the spring on two routes through county lands as a general predictor of population levels.*
- ***Carnivore Surveys*** *are conducted in winter in pre-determined blocks of the forest, looking for sign of wild and domestic animals such as wolf, fox, coyote, bobcat, dogs, and cats. Signs of other mammals may be recorded, but the focus of the survey is on larger carnivores.*
- ***Bear Surveys*** *are important for monitoring the population and regulating the harvest. A new system began in 2019 whereby bear hair is collected on barbed wire as they cross the wire to get at bait. The hair is genetically analyzed as part of a mark/recapture study. This survey will occur every 3-5 years on the forest.*
- ***Kirtland's Warbler Survey*** *have been conducted in the past by state and federal personnel to determine population levels, especially the number of nesting pairs.*

825.4 RESOURCE MANAGEMENT CONSIDERATIONS FOR WILDLIFE

The following areas of focus are identified for achieving plan objectives and for the benefit of wildlife.

825.4.1 General Management Policies

Forest management practices may be modified to benefit wildlife and diversity. The following will be considered when planning for management activities:

- Even-aged regeneration harvests (clearcuts) should vary in size and shape and include retention considerations.
- A diversity of stand age, size and species.
- Mast-bearing trees and shrubs, cavity trees, and an adequate number and variety of snags.
- Cull trees (future snag or den trees) not interfering with specific high value trees.
- Timber types, habitat conditions and impacts on affected wildlife.

- Access management for interior species.
- Best management practices for water quality (BMP's).
- At the landscape level, maintain a continuous supply of acorn producing oaks, while regenerating oak trees for future acorn production.

825.5 IMPORTANCE OF HABITATS

Important habitat types are those cover types known to be of importance to certain native wildlife and whose absence would make that wildlife significantly less abundant. These shortages may be on a local or broader scale. The following habitat types can be considered important:

825.5.1 Non-forested wetlands

The county forest contains 18,000 acres of non-forested wetland types providing a variety of habitats for common, rare and endangered species. Emergent wetland, sedge meadow, muskeg bog and deep marsh provide habitat for species such as wood turtle, black tern, American bittern, and numerous other species.

825.5.2 Aquatic habitats

The county forest includes 1100 acres of lakes, rivers, streams, ponds and other aquatic habitats. Open water provides habitat for species such as wood duck, boreal chorus frog, water shrew and many other species reliant on water related resources.

825.5.3 Riparian and other non-managed areas

Undisturbed shoreline and riparian areas present on the forest and provide habitat for species such as red shouldered hawk, green frog, and woodland jumping mouse.

825.5.4 Early successional forests

Management of aspen, white birch, jack pine and other shade intolerant species creates habitat for a large suite of wildlife species that benefit from early successional forests. On the county forest there are currently 109,000 acres of these forest types present. This is a key habitat used for recreational hunting activities

providing conditions favorable for American woodcock, ruffed grouse, white-tailed deer and non-game species such as golden-winged warbler, Kirtland's warbler and black-billed cuckoo.

825.5.5 Conifers

Conifers, whether jack pine, white pine, spruce, fir or other types appear to be an important habitat for a number of wildlife species. The county forest currently has 35,000 acres of coniferous habitat. Connecticut warbler, red crossbill, northern flying squirrel, and many others utilize conifer types. Jack pine areas can be managed to provide temporary barrens habitat providing habitat for Kirtland's warbler and other barren related species.

825.5.6 Oak management

Oak is an important mast producing food source on the forest, providing acorns for a wide variety of game and non-game species. The county forest has 18,700 acres of oak habitat. It is considered a critical resource to retain on the landscape for both its timber and wildlife value, providing habitat for species such as scarlet tanager, wood thrush, red headed woodpecker, and black bear.

825.5.7 Uneven/all aged management

Management of uneven aged stands provides for multi-storied canopies, diverse age structure and potentially older forest characters. The county forest has 24,000 acres being managed under an all aged management system. Species such as Canada warbler, little brown bat, black throated blue warbler and many others benefit from these forest type, In addition, numerous amphibian and reptiles utilize these forest types.

825.5.8 Large forest blocks

Large blocks of County Forest provide habitat for numerous interior species. Gray wolf, black throated blue warbler, Canada warbler and least flycatcher are a few examples of animals that rely on these large blocks.

825.5.9 Grasslands, openings, upland brush

Wildlife openings, grass rights-of-way, natural openings, upland brush and other upland open habitats provide for diversity and unique habitats benefitting pollinators, numerous species including upland plover and whip-poor-will. The county forest currently has 4000 acres identified as open grassland or upland brush habitat.

825.6 INTENSIVE WILDLIFE MANAGEMENT PROJECTS

825.6.1 Wisconsin Wildlife Action Plan / Species of Greatest Conservation Need (SGCN)

In addition to species listed as endangered, threatened or special concern within the NHI database, the Department also maintains a statewide list of species of greatest conservation need. This list includes species that have low or declining populations and may be in need of conservation action. The list includes birds, fish, mammals, reptiles, amphibians and insects that are:

- Already listed as threatened or endangered
- At risk due to threats
- Rare due to small or declining populations
- Showing declining trends in habitat or populations

The WWAP working list can provide information on how management activities may impact, or in many cases benefit species of greatest conservation need. More information is available on the WWAP website: *https://dnr.wi.gov/topic/wildlifehabitat/actionplan.html* .

825.6.2 Projects on the County Forest

Ruffed Grouse Management Unit

Compartment 201 (Pike River East Hunter Walking Trail) and the northern portion of Compartment 202 (Pike River West Hunter Walking Trail) of the county forest is the Pike River Ruffed Grouse Management Unit. This area consists of 2468 acres. As such, this area receives more attention for grouse management than other areas of the forest. This is a cooperative effort between the County, DNR, and in recent years, the Dunbar Sportsman's Club. Efforts are being made to harvest the aspen in smaller patches and diversify the age classes. Some alder shearing has occurred, trails are being maintained, and recently, crabapple trees have been planted.

Kirtland's Warbler Management Area

This area, in the Town of Dunbar, encompasses about 19,500 acres contained within 19 forest compartments. The Kirtland's Warbler is a State Endangered Species. As of 2019, it is no longer federally listed, but the county will continue to improve habitat for this bird. The primary activity is planting jack pine, which is the preferred habitat. In recent years, county staff have created small openings in existing jack pine stands and conducted herbicide trials to decrease the amount of sedge and increase the forb component.

Athelstane Barrens

Athelstane Barrens is designated in the Wisconsin Wildlife Action Plan as a globally significant ecological opportunity area. The core of the barrens is a 191 acre area that is intensively managed to perpetuate and restore it to a pine barrens condition. The core and surrounding area has been official designated as an 'Important Bird Area' by the Wisconsin Bird Conservation Initiative and is important habitat for a wide variety of plant and animal species. Intensive invasive plant control occurs every year and prescribed burning is conducted every few years. The site has high potential for large-scale restoration and management of pine barrens.

Wildlife Opening Maintenance

There are 336 maintained wildlife openings on the forest, for a total of about 700 acres. These are highly valuable for wildlife and are visited every 5 years to control encroachment using herbicides (spot treatment).

825.7 Fish and Waters Management

Public waters shall be managed to provide for optimum natural fish production, an opportunity for quality recreation, and a healthy balanced aquatic ecosystem. Emphasis will also be placed on land-use practices that benefit the aquatic community. Management of County Forest lands will attempt to preserve and/or improve fish habitat and water quality.

825.7.1 Technical Planning and Surveys

Management of all waters within the County Forest is the responsibility of the DNR. Technical assistance will be provided by the local fisheries biologist. Studies and management will be conducted in the manner described in DNR Fish Management Handbook 3605.9. Water and Population Surveys fall under the jurisdiction of the Department and will be conducted as needed by fisheries biologists.

825.7.2 Special Projects

Marinette County has formed partnerships to carry out special fisheries projects on waterbodies found on County Forest Lands. These projects included trout stream habitat improvements, fish cribs, fish sticks, and shoreline restoration work. These types of projects will continue in order to provide better fisheries.

825.7.3 Shoreland Zoning

825.7.4 Access and development

Access and development of County Forest waters will be limited to those activities consistent with the above water management policies. See Chapter 740 also for further information on water access.

825.7.5 Important Water Resources

The forest contains many high quality bodies of water, especially trout streams. The DNR maintains an inventory of the many miles of Outstanding and Exceptional Waters found in the county. All waters are protected by practicing Wisconsin's Forestry Best Management Practices for Water Quality. The state designated Pike Wild River receives more recognition and management consideration than the other bodies of water. Marinette County agrees to manage their forest lands along the Pike Wild River according to the guidelines set forth by the state. The zone within 400 feet of the river is the most critical area. More is said about this agreement in Section 830.2.5.

830 EXCEPTIONAL RESOURCES, UNIQUE AREAS

830.1 FORESTS WITH EXCEPTIONAL CONSERVATION VALUES

Since Marinette County is not FSC certified, it does not have any High Conservation Value Forests (FSC terminology), but it does have Exceptional Resources and Unique Areas which are described in the following sections. Please see Marinette County Exceptional Resources Map for detailed locations of these areas.

830.2 AREAS RECOGNIZED BY STATE OR FEDERAL GOVERNMENT

830.2.1 State Natural Areas

The Marinette County Forest has one State Natural Area (SNA), and it is described as follows: The **Beech Forest State Natural Area** is 35 acres of mature northern mesic forest, containing a high proportion of beech. It is located in the Town of Silver Cliff, on County Highway I (Parkway Road), between Wolfe Lane and Camp 5 Road. It has been a State Natural Area since 1967 per a MOU between Marinette County and the State. The

area is described by ecologists as a “beech outlier with exceptional research values”. The MOU limits the cutting of timber to only what is essential to road maintenance and the safety of forest users. Signage on the public road indicates that this is a state natural area. Forest recon done in 2019 indicates that the Beech Forest also contains dense groves of old hemlock trees, scattered old red oak, and other northern hardwood species such as sugar maple. One 48” DBH sugar maple was discovered, which is among the largest sugar maples found in the county. Many beech trees are hollow and of low timber value.

830.2.2 State Scientific Areas

There are currently no State Scientific Areas on the Marinette County Forest.

830.2.3 Endangered species habitats

Kirtland’s Warbler

The Kirtland’s Warbler is the most significant endangered species that is currently being managed for on the forest. The previous 15 year plan did not mention this bird because it was not discovered as a nesting species in Marinette County until 2008. Since this discovery, a block of the county forest, located in the Town of Dunbar, has been designated as the Kirtland’s Warbler Management Area. This area encompasses about 19,500 acres contained within 19 forest compartments. The plan for this area is to significantly increase the acreage of jack pine, since the warbler requires large, young, even-aged stands. Federal money has been used in the past to assist in reaching this goal, and should be available into the future even though as of 2019 the Kirtland’s Warbler was delisted as a Federal Endangered Species. The bird will continue to be a State Endangered Species, which means nesting habitat should be protected during the critical spring period. Marinette County remains committed to increasing the habitat within the designated management area, or elsewhere if nesting birds are found.

830.2.4 Rare communities

There are no rare communities to mention in this plan, however there are many unique and exceptional areas, some of which are mentioned in other sections of this plan.

830.2.5 Others

Pike Wild River

The Pike Wild River is designated by state statute 30.26 with the intent of preserving, protecting and enhancing the natural beauty and values of the river. Section (3)(c) of the original legislation directed the DNR to collaborate with county and town government to meet the objectives of the wild river. In 1991 Marinette County entered into a cooperative agreement with the WDNR. The agreement defines how forest management within the Pike River protection zone will be implemented on the Marinette County Forest. In addition to the agreement, the Pike Wild River property manager reviews all county forest timber sales that are proposed within 400 feet of the river. This includes the North Branch, the South Branch, and all of the river downstream from where the North and South Branches meet, wherever county forest land occurs. Approximately 20 miles of river is involved.

830.3 AREAS RECOGNIZED BY COUNTY OR LOCALLY

830.3.1 Forests with Old Growth Characteristics

Generally speaking, there are not large areas of forest with old growth characteristics on the county forest, except for extensive stands of lowland timber types, especially white cedar, which are generally not harvested, and are continually gaining more and more old growth characteristics. In addition, older stands of hemlock are usually not harvested and have old growth qualities. An example of one of these stands of hemlock is as follows:

The McClintock Hemlocks Exceptional Resource Area is a 52 acre mature hemlock stand located within and adjacent to the McClintock County Park on the Peshtigo River in the Town of Silver Cliff. Most of the area is west of the river and has islands of northern hardwood species mixed in. Most of the hemlock is classified as large sawtimber and the stand could be described as having old growth characteristics. The age of the stand has not been determined, but many trees easily exceed 100 years in age. The stand was last observed by DNR Ecologists in 1994. Forest recon was updated in 2019 by Foresters. The timber should probably be managed except in the park proper, slowly converting the species composition to northern hardwoods, retaining a component of old growth individual hemlock trees for as long as possible, especially in the riparian zone. The hemlock is unlikely to regenerate itself and will probably be subject to attack by the wooly adelgid in the future, possible eliminating hemlock from the area.

830.3.2 Wildlife Sites (Hibernacula, Rookeries, Special Habitats

There are no significant Wildlife Sites known on the forest. The Kirtland's Warbler Management Area is mentioned elsewhere in this plan.

830.3.3 Savannas, Barrens, etc.

The Athelstane Barrens Exceptional Resource Area is 191 acres of pine barrens located in the Town of Athelstane, in the vicinity of CFR's 221 and 223. The barrens is one contiguous area, divided into three roughly equal burn units. Some areas have been managed longer for barrens than others, so these areas have more barrens characteristics. Many prairie/barrens plant species are found in the barrens, including the state threatened plant, Dwarf Milkweed. Prescribed burning is applied to each burn unit every few years to help achieve more barrens conditions. The Athelstane Barrens was formerly managed for sharptailed grouse, but the reappearance of grouse probably will not occur since they need much larger areas to thrive. An old railroad grade crosses the barrens and the remains of a homestead can be found near Heubler Lake.

The Best Thicket Exceptional Resource Area is a 116 acre mosaic of boreal forest (primarily black spruce), northern sedge meadow, alder thickets, and shrub-carr. The shrub communities are undisturbed with a diverse composition. It is located in the Town of Dunbar, on both sides of Spur Lake Road, just off County Highway U. The thicket was first observed by DNR Ecologists in 1981 and more recently observed by Foresters in 2019. Portions of the black spruce were clear-cut in the late 1980's during a spruce budworm outbreak and are growing back to a mixture of black spruce, tamarack, and white pine. Some commercial harvesting of the remaining black spruce would be acceptable since it appears that it will regenerate, however it may not be practical since the spruce pockets are somewhat small and primarily on wet ground.

830.3.4 Geological Features of Significance

Northern Marinette County contains an abundance of surface bedrock features. A few of the more significant features are described below:

The Twin Lake Dry Glades Exceptional Resource Area is 30 acres of exposed granite bedrock located just southwest of Twin Lake in the Town of Niagara. This area is distinctly raised above the surrounding landscape and was described by DNR ecologists in 1994 as an acid bedrock glade. This glade harbors many prairie species of plants. The tree growth is sparse and stunted due to the harsh conditions. The cool, damp, north aspects contain a completely different assemblage of plants such as polypod ferns. Commercial harvest of timber would not be possible or desirable here.

The Twin Lake Headwaters Exceptional Resource Area is 58 acres that is divided into two adjacent features; an 8 acre very rare boreal rich fen, and 50 acres of exposed granite bedrock which rises distinctly above the surrounding landscape. This is located in the Town of Niagara, northeast of Echo Lake. This area was inventoried in 1994 by DNR Ecologists. The granite bedrock feature contains, among many other things, a moist talus forest, which has its own unique assemblage of specialized plants. Similarly, the fen has unique plants, possibly rare, including orchids. Tree growth is generally sparse on the granite areas and there are no commercially harvestable trees in the fen. Commercial harvesting of timber would not be possible or desirable here.

The Twin Lake Headwaters Gorge Exceptional Resource Area is 94 acres that is divided into two adjacent features; a 16 acre sedge meadow and 78 acres of exposed granite bedrock which rises distinctly above the surrounding landscape. This is located in the Town of Niagara, just northeast of Twin Lake. This area was inventoried in 1994 by DNR Ecologists and they describe the features as "a savanna like forest on talus slopes", and "a high quality sedge meadow along the stream". The granite areas have sparse growth of trees such as pine, oak, and aspen. The north facing rock faces contain unique plants that can grow only in these cool shaded habitats. There is little commercial value of timber in this area due to the harsh growing conditions on the bedrock. Commercial timber harvesting is not recommended or desirable.

The Spikehorn Canyon Exceptional Resource Area is 69 acres containing complex exposed granite bedrock features distinctively rising above the surrounding landscape, with the Spikehorn Creek and a small tributary running through the area. The Spikehorn is a Class II trout stream. It is located in the Town of Niagara, about ½ mile upstream from Morgan Park Road. It was visited in 1994 by DNR Ecologists and they state that the Spikehorn Canyon "features a series of bedrock glades and cliffs on both sides of Spike horn Creek" and "rare ferns and snails live there". In 2019 Foresters noted uncommon plant assemblages growing on the rock formations, especially on the north aspects where lack of direct sun keeps the site cool and moist. Of particular interest was the large number of Mountain Maples growing there, presumably where deer could not browse them off.

830.3.5 Waterfalls, Wild Rivers, Wild Lakes

Marinette County is the waterfalls capital of Wisconsin and some of those are mentioned in this section. The Pike Wild River is the only state designated wild river in Marinette County and it is described in a previous section of this plan. Designated wild lakes are described and listed in Section 720 of this plan, so they are not mentioned again in this section. Some of the wild lakes are also Exceptional Resources and they are described in this section. The details of these features are as follows:

The Long Slide Falls Exceptional Resource Area is 39 acres in size and includes the Long Slide Falls, plus the bedrock features and conifer swamp just upstream and

downstream from the falls. It is located in the Town of Niagara, off Morgan Park Road. The falls is part of the county park system. The area was inventoried by DNR Ecologists in 1994 and they state that "this falls is the most complex of the numerous waterfalls in Marinette County with many plunges and cascades. The continuously moist cliff walls harbor rare fern and liverwort species". The bedrock features adjacent to the walls support other specialized plants which are able to tolerate the rigorous acid bedrock glade conditions. The conifer swamp is not unusual, but is part of the riparian zone protecting the river. There is no opportunity for commercial timber harvesting.

The North Fork Pike River Waterfalls Exceptional Resource Area is an approximate 3 mile stretch of the Pike River located in the Town of Dunbar, beginning upstream from 18 Foot Falls and continuing downstream from 8 Foot Falls where county land ownership ends. This feature includes the waterfalls mentioned above and the Twelve Foot Falls County Park. About 14 total acres of surface water is involved in this feature. This branch of the Pike River is a designated Wild River by the State of Wisconsin. The river was last inventoried by DNR Ecologists in 1994. The river is described as containing clear water that is slightly alkaline and flows over sand, gravel, and rock outcrops. Along the shore are small areas of older growth pine forest. The river contains a diverse dragonfly fauna including six special concern species: Kennedy's Emerald (Somatochlora kennedyi), Riverine Clubtail (Stylurus Amnicola), Zebra Clubtail (Gomphurus ventricosus), and Rapids Clubtail (Gomphus quadricolor).

The Peshtigo River Exceptional Resource Area is an approximate 12 mile stretch of the Peshtigo River located entirely in the Town of Silver Cliff, beginning at the Marinette/Forest county line and extending downstream to where the county land ownership ends, approximately one mile south of Wilson Rapids near Fisherman Lane. This feature includes 155 acres of free flowing surface water, flowing through both the Goodman Park and the McClintock Park. Some falls and rapids can be found here. This stretch of river has many exceptional qualities, but in particular, it has a diverse dragonfly fauna, as identified in surveys done by DNR Ecologists in 1993. Most of the species of concern are found in areas of fast moving water. One state-endangered species, the Pygmy Snake tail (Ophiogomphus howei), and three special concern species; Skillet Clubtail (Gomphurus ventricosus), Rapids Clubtail (Gomphus quadricolor), and Cyrano Darner (Nasiaeschna pentacantha), have been recorded from the upper reaches of the river. These

species are a testimony to the high quality of the water.

The Kidd Lake Exceptional Resource Area is a 22 acre, shallow, hard water, Seepage Lake completely surrounded by county owned land. The 22 acres is all surface water. It is located in the Town of Dunbar on Kidd Lake Road. Since it is shallow, the only fish it contains are minnows. The lake was observed by DNR Ecologists in 1994. Foresters canoed it in 2019. A nice campsite exists at the landing area. Some duck hunting occurs. Upland forest management occurs close to the lake, but should have no significant influence on the qualities of the lake.

The Porcupine Lake Exceptional Resource Area is a 48 acre, shallow, hardwater, Seepage Lake and a northern wet forest. Only 4 acres of surface water is in the county forest, while the balance is part of the Goodman Legacy Forest. Porcupine Lake is located in the Towns of Silver Cliff and Goodman, on Porcupine Lake Road. The lake has medium hard water of medium brown color and a littoral zone of 60% silt, 30% rubble, and 10% gravel. A large conifer bog (Northern Wet Forest) extends to the south and west, while a maple/hemlock woods occurs on the surrounding uplands. The area was observed by DNR Ecologists in 1994 and canoed by Foresters in 2019. Some duck hunting is evident. Ice shoves can be seen along the shoreline.

The Hobachee Lake Exceptional Resource Area is a combination of 8 acres of surface water and 30 acres of surrounding cedar swamp. It is located in the Town of Goodman, on Shrine Road, about one mile north of State Highway 8. The area was last observed by DNR Ecologists in 1981 and canoed by Foresters in 2019. The canoe landing is barely used and there is a nice campsite located there. The lake is described as a shallow, hard water seepage lake with slightly acid dark brown water. The littoral zone is all muck. Minnows are probably the only fish in the lake. The cedar swamp is described as a Northern Wet Mesic Forest. The swamp is directly important to the protection of the lake, so it should not be harvested.

The Spur Lake Exceptional Resource Area is 36 acres, consisting of 13 acres of surface water, 13 acres of adjacent cedar swamp, and 10 acres of adjacent emergent vegetation. It is located in the Town of Dunbar, at the northern end of Spur Lake Road, near the Florence County line. In 1994 DNR Ecologists inventoried the area and reported that the lake

contains an unusual water chemistry and therefore provides conditions for several very restricted species. Featured are hard water springs and spring runs, a hard water drainage lake, and a cedar swamp. Rare species found here include Slender and common bog Arrow-grass (Triglochin palustre and T. maritimum), Variegated Scouring- rush (equisetum variegatum), Delta-spotted Spiketail (Cordulegaster diastatops), Elfin skimmer (Nannothemis bella), Green-striped Darner (Aeshna verticalis), Kennedy's Emerald (Somatochlora kennedyi), Forcipate Emerald (somatochloraforcipata), Delicate Emerald (Somatochlora franklini), Dion skipper (Euphyes dion), Dorcas Copper (Lycaenba Dorcas) and Tawny Crescentspot (Phycoides batesii). The marly nature of the littoral areas makes this site unique in Marinette County. On a 2019 canoe trip by Foresters, it was noted that there are at least 2 spring fed inlets on the west side, several visible springs in the lake bed, and some logging era corduroy on the lake bed on the east side. The Spur Lake Exceptional Resource Area is unique enough that the state may designate it as a State Natural Area with the county's approval.

The Frying Pan Lake Spruce Bog Exceptional Resource Area is 71 acres in size and is located in the Town of Stephenson at the end of CFR 1619, about 11/2 miles north of County Highway W. Of the 71 acres, about 6 is open water and 65 is northern wet forest. The total lake acreage is 26, and most of it is under private ownership. A carry in boat landing exists on county land. The site was observed in 1981 by DNR Ecologists and again in 2019 by Foresters. Ecologists describe the area as featuring a deep, hard water, slightly alkaline, Seepage Lake and a northern wet forest. A large black spruce dominated conifer swamp occurs north of the lake. Rare orchids could be found there. A small creek empties into the lake. The spruce trees are about 65 years old and the white cedar about 100 years old. For the protection of the lake and the creek, no commercial harvesting is recommended in the wetlands.

The Perch Lake Wetlands Exceptional Resource is an 86 acre area consisting of 9 acres of open water, 20 acres of black spruce, and 57 acres of emergent vegetation. It is located in the Town of Silver Cliff, near the intersection of Harper and Swede John Roads. It was observed in 1981 by DNR Ecologists and the lake was canoed by Foresters in 2019. It is described as a high quality seepage lake with surrounding sedge meadow, open bog, northern wet forest, and emergent aquatic communities. The bottom is all muck. The communities are interspersed, permitting the development of diverse species assemblages. The lake has an outlet which cuts through a distinct ridge, and this feature makes it subject to periodic beaver damming. A foot path, several hundred feet long, connects a parking area to the lake. The black spruce swamp does not contain timber of significant commercial value, and is valuable for the protection of the adjacent wetlands, therefore no harvesting is recommended in this stand.

830.3.6 Unique Forest Types, Benchmark Stands, etc

The Dunbar Swamp Exceptional Resource Area is a 94 acre stand of predominantly mature black spruce located northwest of CFR 520 in the Town of Dunbar. The stand is not contiguous, but rather it consists of six separate areas that are close to each other and are separated by areas of tag alder. Forest recon data indicates that the stand originated in 1912, which makes the age of the black spruce over 100 years. The stand was first observed by DNR Ecologists in 1981 and more recently by Foresters in 2017. Portions of the stand, especially on the west end, are growing on uplands which is somewhat uncommon and the trees are uncommonly large in diameter and height for black spruce in Marinette County. The undisturbed ground layer has unique flora. The Dunbar Swamp has survived at least two outbreaks of Spruce Budworm, which occurs about every 40 years. For the foreseeable future, it would be desirable to exempt this area from timber harvesting for the purpose of creating an old growth black spruce stand and studying its characteristics.

830.3.7 Endangered or Threatened Species Habitat

The Shrine Road Openings Exceptional Resource is 77 acres of forest openings divided into 4 separate units that are in close proximity. They are located in the Town of Goodman, near the intersection of the Shrine Road with CFR 606. The

openings contain scattered trees such as red pine and black cherry, but they are predominantly open and contain plants which grow on sandy soils such as blueberries, sweet fern, and sedges. The plant found here which is of greatest importance is the Dwarf Bilberry, which is an endangered species and is the only food source for the endangered Northern Blue Butterfly. As of 2019, both species are difficult to locate in the openings and starting in 2019, prescribed fire was applied to one of the openings to try to increase the amount of bilberry. Prior to 2019, Marinette County Forestry employees have also been utilized to remove trees from the openings. At one time, these openings contained the largest population of Northern Blue Butterflies in the state. Maintaining these openings does not significantly affect the production of the surrounding forest. However, the openings should not be used for timber harvesting operations.

830.4 CULTURALLY SIGNIFICANT SITES

830.4.1 Native American:

Although Native Americans undoubtedly lived on lands that are presently owned by the county, there are no known sites. If sites are discovered, they will be protected.

830.4.2 Logging Era Sites:

The forest has a rich logging history, starting with the harvesting of pine after the civil war. Some of the logging era landmarks and their names still remain and will be part of the forest long into the future. Some of these features are listed below:

Logging Camps: a few of the logging camps that were associated with the forest are Camps 5, 9, 10, 12, F, D, and Sidney. There are still roads and creeks named after these camps. Some evidence of these camps can still be found in the form of building foundations. Where practical, these features will be protected.

Dams: Rivers were used extensively to float pine logs to sawmills. Dams were built to store water until the spring melt, at which time the water was released to

create enough flow to move the logs downstream to the Menominee River, which was the main artery to the sawmills. Some dams were located on what is presently county forest land, and in some cases, evidence of their existence still remains. On the Pike River, dams were located at Carney Rapids and Dave's fall. On the North Branch of the Pemebonwon River, the names of some dams are Pine Dam, Timm's Dam, Bull Dam, and Long Slide Falls Dam. At Long Slide Falls, a wooden chute was built to get the logs down the falls without hanging up. There was also a dam on the KC Creek.

Railroad Grades: In order to get pine logs to market where they were not near a river, or hardwood logs to the sawmill, railroads were built to transport logs. To create a reasonable grade that trains could travel on, the rail bed had to be cut through hills or built up in wetlands, moving large amounts of earth and rock. These grades remain on the landscape, providing lasting evidence of the time when the trains played an important role in harvesting the timber. Many of these grades are used as town roads today.

830.4.3 Settlements:

As the original forest was depleted by logging, farmers moved onto the land, hoping that land which grew large trees could grow good agricultural crops. Settlements were started on land that would later become county forest land as the farming failed. A fair amount of evidence of these settlements remains which the county will make reasonable efforts to protect. The names of some of these more significant settlements are Phillipsburg, Taylor's Rapids, Girard Junction, Walton, Andan, and Kremlin. Some of the significant features found at some of the settlements are as follows:

- Cemeteries: there are cemeteries at Walton and Taylor's Rapids.
- Churches: There was a church at Phillipsburg.
- Post Office: Walton had a post office.

- Schools: Many settlements had schools, including Girard Junction, Phillipsburg, Taylor Rapids, and the Kube School which was located on Firelane Road just south of Jones Road.

830.4.4 Fire Towers:

After the year 1930, forest fire control efforts in Marinette County necessitated the building of fire towers. Two towers were erected on county forest land. One was near Girard Junction and the other was at the Lake Mary Unit of the county forest. Both towers have been removed, the Lake Mary Tower as recently as 2018, however the footprint of both towers remains.

830.4.5 Government Camps:

In the distant past, two government camps were established on what is presently county forest land. The county will make reasonable efforts to protect the evidence of these camps. Civilian Conservation Camp Dunbar: Established in 1933 on the southern edge of the community of Dunbar, the camp was operated until 1941. Over 100 young men worked out of the camp on numerous conservation projects including the construction of the Goodman County Park. When the camp was closed, much of the site was planted to pine. Athelstane State Forestry Camp: Also, known as the "Prison Camp", this camp operated from about 1933 to 1943, and was located in the Town of Silver Cliff off of Camp 10 Road. Presently, the camp location is only partially on county land, the majority is located on the BCPL lands. The camp housed about 50 prisoners at a time and their main duties were cutting fire lanes, fighting fire when needed, and planting hundreds of thousands of trees.

830.4.6 Other Cultural Sites:

Two Shrines are located on the forest. The Lost Hunter's Shrine is located on the Benson Lake Road near the Forest County Line. This small shrine has a parking area alongside Benson Lake Road. The shrine has a small area for paying respects to the Lost Hunter with a bench to sit on. The St. Hubert Shrine located on the end

of CFR 610 off the Shrine Road. This shrine has a rustic bathroom, a picnic area, an open sided shelter, and an open area for overnight primitive camping. These shrines have been in existence for 50 years or more and are a part of the fascinating history of the forest. They both pay tribute to honoring and protecting area hunters. Both of these sites are maintained by area volunteer groups.

835 AESTHETICS

Public perception of forestry has changed over the last planning period and in general it appears that the public is much more accepting of the visual impact of sound forestry. In response to this, aesthetic management planning is intended to be much more simplified in this Plan.

835.1 AESTHETIC MANAGEMENT

Aesthetic management techniques may be applied in areas of high visibility or high public use. Altered management, visual screens, slash disposal, conversion to other species, no cut zones or other methods may be employed, depending on the circumstances of the specific site.

835.2 AESTHETIC MANAGEMENT ZONES

Aesthetic Management Zones include areas where there may be high levels of public presence because of scenic attraction, or some use of the area that would be enhanced by special timber management practices.

835.2.1 Aesthetic Management Zone Examples

- Park and recreation areas, including campgrounds, boat landings, waysides, and the Camp Bird Youth Center.
- Lakes and rivers with significant recreational use, such as the Pike and Peshtigo Rivers.
- Roads with heavy traffic or scenic drive, such as state highways, County Highway I, and Right of Way Road near Lake Noquebay.

835.2.2 Aesthetic Management Prescriptions/Options

- Adjustment timing of timber harvesting
- Slash restrictions/requirements
- Staggered Harvests / Visual Screens
- Forced conversion to longer lived species
- Irregular harvest lines, interrupted sight distances
- Retention of individual trees or islands of trees

840 LANDSCAPE MANAGEMENT

The County will make efforts to evaluate surrounding landscapes while managing the County Forest. The County will strive to provide management that compliments the landscapes, but also try to provide for resources or forest types that are lacking or declining within surrounding landscapes.

840.1 CONSERVATION OF BIOLOGICAL DIVERSITY

For the purposes of this plan, biological diversity will be interpreted to reference the variety and abundance of species, their genetic composition, and the communities, ecosystems, and landscapes in which they occur. Forest management activities on the forest enhance biological diversity by managing for a wide variety of habitat types, age structures and by attempting to perpetuate and protect declining forest types.

840.2 HABITAT FRAGMENTATION

For the purposes of this plan, habitat fragmentation is interpreted as conversion of forests to land uses other than forestry. Lands enrolled in the County Forest Law help protect against habitat fragmentation. A continued program of encouraging land acquisition within the forest blocking boundary is intended to decrease the conversion of forest land to other uses.